Appendix J

Summary of Quality Assurance Crosscheck Analyses

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Table J-1
Crosscheck Sample Comparisons From the DOE Environmental Measurements Laboratory (EML) Quality Assessment Program (QAP) 60; QAP 0403; June 2004

Analyte	Matrix	Units	Actual	Reported	Ratio	Accept?	Analyzed by:
Co-60	Air filter	Bq/filter	35.4	36.3	1.025	Yes	ELAB
Co-60	Air filter	Bq/filter	35.4	36.4	1.028	Yes	ELAB
Cs-137	Air filter	Bq/filter	26.4	27.8	1.053	Yes	ELAB
Cs-137	Air filter	Bq/filter	26.4	27.7	1.049	Yes	ELAB
Gross Alpha	Air filter	Bq/filter	1.2	1.16	0.967	Yes	ELAB
Gross Beta	Air filter	Bq/filter	2.85	2.92	1.025	Yes	ELAB
Am-241	Air filter	Bq/filter	0.1045	0.093	0.890	Yes	GEL
Co-60	Air filter	Bq/filter	35.4	35.754	1.010	Yes	GEL
Cs-137	Air filter	Bq/filter	26.4	26.369	0.999	Yes	GEL
Gross Alpha	Air filter	Bq/filter	1.2	1.181	0.984	Yes	GEL
Gross Beta	Air filter	Bq/filter	2.85	2.326	0.816	Yes	GEL
Pu-238	Air filter	Bq/filter	0.0405	0.038	0.938	Pass	GEL
Pu-239	Air filter	Bq/filter	0.1644	0.157	0.955	Yes	GEL
Sr-90	Air filter	Bq/filter	1.76	1.72	0.977	Yes	GEL
U-234	Air filter	Bq/filter	0.0858	0.079	0.921	Yes	GEL
U-238	Air filter	Bq/filter	0.085	0.075	0.882	Pass	GEL
U (total)	Air filter	µg/filter	6.873	6.7	0.975	Yes	GEL
Am-241	Soil	Bq/kg	13.0	12.925	0.994	Yes	GEL
Cs-137	Soil	Bq/kg	1,323.0	1,411.797	1.067	Yes	GEL
K-40	Soil	Bq/kg	539.0	616.667	1.144	Yes	GEL
Pu-238	Soil	Bq/kg	0.82	0.772	0.941	Yes	GEL
Pu-239	Soil	Bq/kg	22.82	22.336	0.979	Yes	GEL
Sr-90	Soil	Bq/kg	51.0	49.765	0.976	Yes	GEL
Th-234	Soil	Bq/kg	84.0	97.446	1.160	Yes	GEL
U-234	Soil	Bq/kg	87.22	77.33	0.887	Yes	GEL
U-238	Soil	Bq/kg	89.73	86.58	0.965	Yes	GEL
U (total)	Soil	µg/g	7.25	6.763	0.933	Yes	GEL

ELAB - Environmental Laboratory
GEL - General Engineering Laboratory

Note: This report has been excerpted to include only those matrix/analyte combinations performed in support of the analyses of samples collected at the WVDP and which are presented in this Annual Site Environmental Report.

Acceptance is based on the reported-to-actual ratio, assigned statistically on a case-by-case basis. ***Yes*** *indicates a ratio within warning limits.* ***Pass*** *indicates a ratio within control limits but outside warning limits.* ***No*** *indicates a ratio outside control limits.*

Table J-1 (concluded)
Crosscheck Sample Comparisons From the DOE Environmental Measurements Laboratory (EML) Quality Assessment Program (QAP) 60; QAP 0403; June 2004

Analyte	Matrix	Units	Actual	Reported	Ratio	Accept?	Analyzed by:
Am-241	Veg	Bq/kg	4.93	4.415	0.896	Yes	GEL
Co-60	Veg	Bq/kg	14.47	15.873	1.097	Yes	GEL
Cs-137	Veg	Bq/kg	584.67	649.967	1.112	Yes	GEL
K-40	Veg	Bq/kg	720.0	830.033	1.153	Yes	GEL
Pu-238	Veg	Bq/kg	0.455	0.545	1.198	Yes	GEL
Pu-239	Veg	Bq/kg	6.81	6.475	0.951	Yes	GEL
Sr-90	Veg	Bq/kg	734.0	852.702	1.162	Pass	GEL
Co-60	Water	Bq/L	163.2	158.0	0.968	Yes	ELAB
Cs-137	Water	Bq/L	51.95	52.4	1.009	Yes	ELAB
Gross Alpha	Water	Bq/L	326.0	299.0	0.917	Yes	ELAB
Gross Beta	Water	Bq/L	1,170.0	1,242.0	1.062	Yes	ELAB
H-3	Water	Bq/L	186.6	230.0	1.233	Yes	ELAB
Sr-90	Water	Bq/L	4.76	5.06	1.063	Yes	ELAB
Am-241	Water	Bq/L	1.31	1.127	0.860	Pass	GEL
Co-60	Water	Bq/L	163.2	157.867	0.967	Yes	GEL
Cs-137	Water	Bq/L	51.95	50.69	0.976	Yes	GEL
Gross Alpha	Water	Bq/L	326.0	336.763	1.033	Yes	GEL
Gross Beta	Water	Bq/L	1,170.0	1,157.069	0.989	Yes	GEL
H-3	Water	Bq/L	186.6	202.991	1.088	Yes	GEL
Pu-238	Water	Bq/L	1.1	1.023	0.930	Yes	GEL
Pu-239	Water	Bq/L	3.08	2.884	0.936	Yes	GEL
Sr-90	Water	Bq/L	4.76	5.144	1.081	Yes	GEL
U-234	Water	Bq/L	2.28	2.199	0.964	Yes	GEL
U-238	Water	Bq/L	2.25	2.188	0.972	Yes	GEL
U (total)	Water	µg/mL	0.182	0.1927	1.059	Yes	GEL

ELAB - Environmental Laboratory
GEL - General Engineering Laboratory

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Acceptance is based on the reported-to-actual ratio, assigned statistically on a case-by-case basis. ***Yes*** *indicates a ratio within warning limits.* ***Pass*** *indicates a ratio within control limits but outside warning limits.* ***No*** *indicates a ratio outside control limits*

Table J-2
Crosscheck Sample Comparisons From the DOE Mixed Analyte Performance Evaluation Program (MAPEP)[a]; May 2004

Analyte	Matrix	Units	Actual	Reported	Acceptance Range	Accept?	Analyzed by:
MAPEP - 03 - W11							
Antimony	Water	mg/L	0.1296	0.121	0.09–0.17	Yes	LVLI
Arsenic	Water	mg/L	0.0537	0.0456	0.04–0.07	Yes	LVLI
Barium	Water	mg/L	0.541	0.523	0.38–0.70	Yes	LVLI
Beryllium	Water	mg/L	0.0985	0.0914	0.07–0.13	Yes	LVLI
Cadmium	Water	mg/L	0.0799	0.0749	0.06–0.10	Yes	LVLI
Copper	Water	mg/L	0.803	0.751	0.56–1.04	Yes	LVLI
Lead	Water	mg/L	0.894	0.844	0.63–1.16	Yes	LVLI
Nickel	Water	mg/L	0.495	0.467	0.35–0.64	Yes	LVLI
Selenium	Water	mg/L	0.06981	0.0654	0.05–0.09	Yes	LVLI
Silver	Water	mg/L	--	0.00084	--	Yes[b]	LVLI
Thallium	Water	mg/L	2.088	1.98	1.46–2.71	Yes	LVLI
Vanadium	Water	mg/L	1.2	1.13	0.84–1.56	Yes	LVLI
Zinc	Water	mg/L	1.037	0.965	0.73–1.35	Yes	LVLI
1,3-Dichlorobenzene	Water	µg/L	39.6	43	14.00–65.16	Yes	LVLI
1,2-Dichlorobenzene	Water	µg/L	22.7	25	9.45–36.03	Yes	LVLI
2,4-Dimethylphenol	Water	µg/L	79.2	79	40.94–117.57	Yes	LVLI
2,4-Dichlorophenol	Water	µg/L	73.1	74	30.38–115.76	Yes	LVLI
1,2,4-Trichlorobenzene	Water	µg/L	41.4	49	0.53–82.22	Yes	LVLI
Napthalene	Water	µg/L	48.2	53	11.02–85.43	Yes	LVLI
4-Chloro-3-methylphenol	Water	µg/L	30.5	33	14.05–46.97	Yes	LVLI
2-Methylphenol	Water	µg/L	45.4	51	15.37–75.49	Yes	LVLI
2,6-Dichlorophenol	Water	µg/L	55.7	60	18.03–93.29	Yes	LVLI
2,6-Dinitrotoluene	Water	µg/L	74.1	69	44.30–103.91	Yes	LVLI
2,4-Dinitrotoluene	Water	µg/L	91.8	110	46.77–136.82	Yes	LVLI
Fluorene	Water	µg/L	28.9	37	QL–85.38	Yes	LVLI
Diethylphthalate	Water	µg/L	61.9	60	26.41–97.43	Yes	LVLI
Phenanthrene	Water	µg/L	23.2	27	QL–49.06	Yes	LVLI
Anthracene	Water	µg/L	35.4	39	QL–78.28	Yes	LVLI
Pyrene	Water	µg/L	35	49	QL–110.01	Yes	LVLI
Benzo(a)anthracene	Water	µg/L	62.1	66	4.91–119.29	Yes	LVLI
Chrysene	Water	µg/L	41.1	46	QL–84.03	Yes	LVLI

LVLI - Lionville Laboratories, Inc.
QL - Quantitation limit

[a] *MAPEP monitors performance and requests corrective action as required.*
[b] *Although no actual values or acceptable range was provided, the results were assessed by MAPEP as acceptable.*

Note: This report has been excerpted to include only those matrix/analyte combinations performed in support of the analyses of samples collected at the WVDP and which are presented in this Annual Site Environmental Report.

Table J-2 (concluded)
Crosscheck Sample Comparisons From the DOE Mixed Analyte Performance Evaluation Program (MAPEP)[a]; May 2004

Analyte	Matrix	Units	Actual	Reported	Acceptance Range	Accept?	Analyzed by:
MAPEP - 03 - W11							
Am-241	Water	Bq/L	--	0.008	--	Yes[b]	GEL
Cs-137	Water	Bq/L	124	118.6	86.80–161.20	Yes	GEL
Co-60	Water	Bq/L	121.8	122.3	85.26–158.34	Yes	GEL
H-3	Water	Bq/L	379	389.7	265.30–492.70	Yes	GEL
Pu-238	Water	Bq/L	1.49	1.364	1.04–1.94	Yes	GEL
Pu-239/240	Water	Bq/L	2.39	2.232	1.67–3.11	Yes	GEL
Sr-90	Water	Bq/L	17.7	17.132	12.39–23.01	Yes	GEL
Tc-99	Water	Bq/L	28.8	23.96	20.16–37.44	Yes	GEL
U-233/234	Water	Bq/L	2.35	2.305	1.64–3.05	Yes	GEL
U-238	Water	Bq/L	2.43	2.184	1.70–3.16	Yes	GEL

GEL - General Engineering Laboratories

[a] *MAPEP monitors performance and requests corrective action as required.*

[b] *Although no actual values or acceptable range was provided, the results were assessed by MAPEP as acceptable.*

Note: This report has been excerpted to include only those matrix/analyte combinations performed in support of the analyses of samples collected at the WVDP and which are presented in this Annual Site Environmental Report.

Table J-3
Crosscheck Sample Comparisons From the DOE Mixed Analyte Performance Evaluation Program (MAPEP)[a]; November 2004

Analyte	Matrix	Units	Actual	Reported	Acceptance Range	Accept?	Analyzed by:
MAPEP - 04 - GrF12 Gross Alpha/Beta Air Filter							
Gross Alpha	Air Filter	Bq/filter	0.37	0.123	>0.0–0.8	Yes	ELAB
Gross Beta	Air Filter	Bq/filter	1.21	1.25	0.6–1.8	Yes	ELAB
MAPEP - 04 - GrW12 Gross Alpha/Beta Water Standard							
Gross Alpha	Water	Bq/L	1.24	0.699	0.0–2.5	Yes	ELAB
Gross Beta	Water	Bq/L	4.07	4.01	2.0–6.2	Yes	ELAB
Gross Alpha	Water	Bq/L	1.24	0.949	0.0–2.5	Yes	GEL
Gross Beta	Water	Bq/L	4.07	4.172	2.0–6.2	Yes	GEL
MAPEP - 04 - MaS12 Soil Standard							
Antimony	Soil	mg/kg	47.1	25.9	33.00–61.20	No	LVLI
Arsenic	Soil	mg/kg	63	60.3	44.10–81.90	Yes	LVLI
Barium	Soil	mg/kg	559.7	557	391.79–727.61	Yes	LVLI
Beryllium	Soil	mg/kg	18.83	17.9	13.18–24.48	Yes	LVLI
Cadmium	Soil	mg/kg	10.03	9.4	7.02–13.04	Yes	LVLI
Chromium	Soil	mg/kg	67	77.0	46.90–87.10	Yes	LVLI
Lead	Soil	mg/kg	62.4	59.8	43.68–81.12	Yes	LVLI
Nickel	Soil	mg/kg	113	111	79.10–146.90	Yes	LVLI
Selenium	Soil	mg/kg	9.09	8.4	6.36–11.82	Yes	LVLI
Silver	Soil	mg/kg	19.8	19.3	13.86–25.74	Yes	LVLI
Thallium	Soil	mg/kg	88.6	84.2	62.02–115.18	Yes	LVLI
Vanadium	Soil	mg/kg	60.8	63.8	42.56–79.04	Yes	LVLI
Zinc	Soil	mg/kg	146	151	102.20–189.80	Yes	LVLI
Am-241	Soil	Bq/kg	67	67.35	46.88–87.06	Yes	GEL
Cs-137	Soil	Bq/kg	836	774.040	585.34–1,087.06	Yes	GEL
Co-60	Soil	Bq/kg	518	510.353	362.60–673.40	Yes	GEL
Pu-238	Soil	Bq/kg	35.4	32.8	24.78–46.02	Yes	GEL
Pu-239/240	Soil	Bq/kg	41.8	3.067	29.27–54.35	No	GEL
K-40	Soil	Bq/kg	604	640.717	422.80–785.20	Yes	GEL
Sr-90	Soil	Bq/kg	[b]	1.21	--	No[c]	GEL
U-233/234	Soil	Bq/kg	37	24.691	25.90–48.10	No	GEL
U-238	Soil	Bq/kg	38.9	30.759	27.19–50.50	Yes[d]	GEL

ELAB - Environmental Laboratory
GEL - General Engineering Laboratories
LVLI - Lionville Laboratories, Inc.

[a] *MAPEP monitors performance and requests corrective action as required.*
[b] *False positive*
[c] *Although no actual values or acceptable range was provided, the results were assessed by MAPEP as not acceptable.*
[d] *Result acceptable with warning 20% < bias <= 30%*

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Table J-3 (continued)
Crosscheck Sample Comparisons From the DOE Mixed Analyte Performance Evaluation Program (MAPEP)[a]; November 2004

Analyte	Matrix	Units	Actual	Reported	Acceptance Range	Accept?	Analyzed by:
MAPEP - 04 - MaW12 Water Standard							
Antimony	Water	mg/L	0.936	0.939	0.66–1.22	Yes	LVLI
Arsenic	Water	mg/L	1.3775	1.400	0.96–1.79	Yes	LVLI
Barium	Water	mg/L	29.3	29.700	20.51–38.09	Yes	LVLI
Beryllium	Water	mg/L	--	0.00010	--	Yes[b]	LVLI
Cadmium	Water	mg/L	0.5524	0.549	0.39–0.72	Yes	LVLI
Chromium	Water	mg/L	0.956	0.963	0.67–1.24	Yes	LVLI
Copper	Water	mg/L	9.162	9.230	6.41–11.91	Yes	LVLI
Lead	Water	mg/L	0.503	0.506	0.35–0.65	Yes	LVLI
Nickel	Water	mg/L	3.0806	3.120	2.16–4.00	Yes	LVLI
Selenium	Water	mg/L	--	0.0039	--	Yes	LVLI
Thallium	Water	mg/L	4.202	4.330	2.94–5.46	Yes	LVLI
Vanadium	Water	mg/L	0.506	0.507	0.35–0.66	Yes	LVLI
Zinc	Water	mg/L	2.292	2.330	1.60–2.98	Yes	LVLI
Cs-137	Water	Bq/L	250	240	175.00–325.00	Yes	ELAB
Co-60	Water	Bq/L	163	159	114.10–211.90	Yes	ELAB
H-3	Water	Bq/L	82.9	85.1	58.10–107.90	Yes	ELAB
Sr-90	Water	Bq/L	7.4	0.459	4.90–9.10	No	ELAB
Am-241	Water	Bq/L	0.59	0.605	0.42–0.78	Yes	GEL
Cs-137	Water	Bq/L	250	236.874	175.00–325.00	Yes	GEL
Co-60	Water	Bq/L	163	162.837	114.10–211.90	Yes	GEL
H-3	Water	Bq/L	82.9	95.726	58.10–107.90	Yes	GEL
Pu-238	Water	Bq/L	1.24	1.277	0.84–1.56	Yes	GEL
Pu-239/240	Water	Bq/L	--	0.020	--	Yes	GEL
Sr-90	Water	Bq/L	7.4	6.685	4.90–9.10	Yes	GEL
Tc-99	Water	Bq/L	10.4	9.098	7.00–13.00	Yes	GEL
U-233/234	Water	Bq/L	0.144	0.141	0.10–0.19	Yes	GEL
U-238	Water	Bq/L	0.94	0.982	0.63–1.17	Yes	GEL

ELAB - Environmental Laboratory
GEL - General Engineering Laboratories
LVLI - Lionville Laboratories, Inc.

[a] *MAPEP monitors performance and requests corrective action as required.*
[b] *Although no actual values or acceptable range was provided, the results were assessed by MAPEP as acceptable.*

Note: This report has been excerpted to include only those matrix/analyte combinations performed in support of the analyses of samples collected at the WVDP and which are presented in this Annual Site Environmental Report.

Table J-3 (concluded)
Crosscheck Sample Comparisons From the DOE Mixed Analyte Performance Evaluation Program (MAPEP)[a]; November 2004

Analyte	Matrix	Units	Actual	Reported	Acceptance Range	Accept?	Analyzed by:
MAPEP - 04 - RdF12 Radiological Air Filter							
Cs-137	Air Filter	Bq/sample	1.96	1.74	1.40–2.60	Yes	ELAB
Co-60	Air Filter	Bq/sample	2.35	2.19	1.61–2.99	Yes	ELAB
Am-241	Air Filter	Bq/sample	0.1	0.12	0.07–0.13	Yes	GEL
Cs-137	Air Filter	Bq/sample	1.96	1.918	1.40–2.60	Yes	GEL
Co-60	Air Filter	Bq/sample	2.35	2.379	1.61–2.99	Yes	GEL
Pu-238	Air Filter	Bq/sample	0.13	0.124	0.09–0.17	Yes	GEL
Pu-239/240	Air Filter	Bq/sample	0.09	0.088	0.06–0.12	Yes	GEL
Sr-90	Air Filter	Bq/sample	0.83	0.783	0.56–1.04	Yes	GEL
U-233/234	Air Filter	Bq/sample	0.21	0.222	0.15–0.27	Yes	GEL
U-238	Air Filter	Bq/sample	0.22	0.227	0.15–0.29	Yes	GEL

ELAB - Environmental Laboratory
GEL - General Engineering Laboratories

[a] *MAPEP monitors performance and requests corrective action as required.*

Note: This report has been excerpted to include only those matrix/analyte combinations performed in support of the analyses of samples collected at the WVDP and which are presented in this Annual Site Environmental Report.

Table J-4
Crosscheck Sample Comparisons of Results Analyzed for Water Quality Parameters as Part of the EPA's 2004 Discharge Monitoring Report - Quality Assurance (DMR-QA) Study 24 for the National Pollutant Discharge Elimination System (NPDES)

Analyte	Units	Actual	Reported	Acceptance Range[a]	Accept?	Analyzed by[b]:
Aluminum	µg/L	639	661	538–739	Yes	STL
Ammonia (as Nitrogen)	mg/L	12.5	12.1	9.71–15.2	Yes	STL
Arsenic	µg/L	355	342	296–417	Yes	STL
Biochemical oxygen demand	mg/L	75.3	55.2	38.0–113	Yes	STL
Cadmium	µg/L	690	648	589–783	Yes	STL
Chlorine, total residual	mg/L	1.14	1.20	0.890–1.39	Yes	WVNSCO
Chromium	µg/L	298	292	258–338	Yes	STL
Cobalt	µg/L	595	610	523–667	Yes	STL
Copper	µg/L	226	237	203–250	Yes	STL
Cyanide, total	mg/L	0.449	0.376	0.308–0.580	Yes	STL
Grease and Oil (Gravimetric)	mg/L	31.0	26.9	19.7–36.3	Yes	STL
Iron	µg/L	770	772	679–872	Yes	STL
Lead	µg/L	392	378	339–443	Yes	STL
Manganese	µg/L	817	837	734–908	Yes	STL
Mercury	µg/L	13.4	8.38	10.0–16.7	No	STL
Nickel	µg/L	285	287	252–322	Yes	STL
Nitrate (as Nitrogen)	mg/L	10.6	11.8	8.38–12.6	Yes	STL
pH	SU	8.43	8.44	8.18–8.67	Yes	WVNSCO
Phenolics, total	mg/L	0.220	0.193	0.114–0.326	Yes	STL
Selenium	µg/L	466	446	368–540	Yes	STL
Suspended solids, total	mg/L	37.9	36.0	28.0–40.4	Yes	STL
Vanadium	µg/L	603	600	542–662	Yes	STL
Zinc	µg/L	301	304	264–342	Yes	STL

Samples provided by Environmental Research Associates (ERA)

[a] Acceptance limits are determined by ERA or the New York State Department of Health (NYSDOH), as applicable.

[b] Analyses were conducted by Severn Trent Laboratories (STL) or the WVDP Wastewater Treatment Facility Laboratory (WVNSCO).